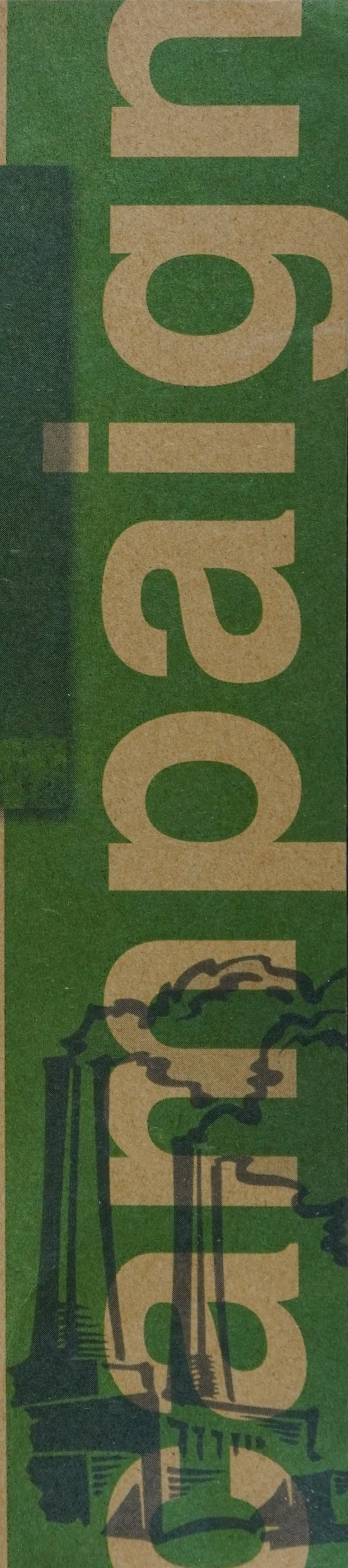
PUTTING OUT THE FLAMES

Campaigners guide to fight incinerators



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OCTOBER 2001

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Srishti is an environmental group registered as a society. It is involved in issues regarding the environment, waste, toxicity and communities. Srishti envisions a comprehensive waste management policy, which would include public participation, a packaging policy and producer's responsibility to take back non-biodegradable and toxic waste and opt for cleaner materials and products.

TOXICS LINK is a non-profit environmental organisation working towards a toxics free world. Operating since 1996, Toxics Link has three information outreach nodes in Delhi, Mumbai and Chennai respectively. The nodes provide information to grassroots groups, organisations and individuals as well as networks working on environmental toxicity issues.

Authorship

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The information provided in this document may be reproduced, transmitted and translated with proper acknowledgement.

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Introduction

Incineration is a controversial technology used to burn waste. The types of waste normally burnt by this process are municipal, medical and hazardous waste. Incineration is a disposal technology that gets rid of wastes. However, since it is a combustion process, its by-products - ash and air emissions - are highly toxic and dangerous to the environment and human health. Their toxicity depends on the nature of the waste stream. For instance, if Poly Vinyl Chloride (PVC) or any other chlorine-containing product is burnt, it produces super toxins like dioxin and furans, while chemical waste produces a wide variety of pollutants including toxic heavy metals like lead, cadmium, arsenic, mercury and chromium.

The West, where incinerators are more prevalent, has now recognised their toxic effects. Communities living in the vicinity of incinerators have been resisting them. Also, innumerable health and epidemiological studies have forced regulatory agencies to make emission norms (rules) even more stringent. For example, a single 2,000 metric tonne/day capacity municipal incinerator in Amsterdam costs more than US $500 million, over 60 per cent of which goes towards pollution control equipment. In October 1998, the European Union unveiled a plan to cut its incineration emissions at a cost of US $672 million to save over US $900 million in health costs.

Even after installing the state-of-art pollution control equipment, there is still a need to monitor and analyse dioxin and furan levels in incinerator releases like stack gases, fly ash, bottom ash or slag and other residues (effluent and sludge from wet scrubbers, quenching water, etc). To ensure compliance with requisite legal standards, as stipulated in the developed countries, is both costly and complex. Fewer than 50 laboratories in the world have been certified by the World Health Organization to conduct analysis of dioxins in human tissue. The cost of establishing a laboratory for dioxin analysis is estimated at US $1.5-2 million.[1] The cost of dioxin assessment alone ranges from US $1,000 to US $3,000 per sample.[2] Even in the wealthiest of countries, such costs are barriers to adequate monitoring of incinerator releases, as illustrated by the admitted paucity and uncertainty of relevant data presented in the European Union's dioxin inventories.[3,4]

Incinerators are undesirable not only because they adversely affect health and the environment but also what they represent – unfettered consumerism, extra-packaging, short-term waste management practices and lack of producer responsibility

Once an accepted technology in the West, incineration is being gradually phased out as a result of communities protesting its health hazards. Incinerators are undesirable not only because they adversely affect health and environment but also what they represent - unfettered consumerism, extra-packaging, short-term waste management practices and lack of producer responsibility. The growing realisation of the effects of incineration has led communities to fight against extra-packaging and made manufacturers behave in a more responsible manner. Communities also explored alternatives to incinerators, which led to a halt in the use of incineration as a waste management system around the world.

Ironically, though discredited in the West, this technology is now being installed all over India in various forms. Technology vendors, with active support from governments, are now trying

to establish markets in the developing countries where awareness about dangers of incineration and similar burn technologies is negligible. The mistakes of the West are being forced on the unaware citizens of poorer countries! Palming off dirty technologies on the developing nations is not only unethical, but also leads to the draining of the local economy in form of higher taxes, wiping off the informal recycling sector and pre-empting efforts by countries to choose a just and clean path of development.

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It makes more sense to invest in clean and less polluting technologies and products that are suitable and specific to the needs of a community. There are examples from all over India and around the world where communities have come together in managing their waste locally and have set successful community-based waste management models.

This campaign guide is an attempt to:

- Explain the myth of incineration
- Provide suggestions for campaigns against incinerators (burn technologies)
- Suggest alternative methods for waste management

The guide does not claim to provide all suggestions and answers to a campaign, as each campaign is shaped by local needs, pressures and circumstances.

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Why oppose incineration?

People may ask why incineration as a technology is so bitterly opposed. Simply put, the answer is: '**incineration pollutes**'. However the use of incineration also affects our day-to-day life in many other subtle ways. Incineration ensures, while giving the feeling that waste is being *managed*, promotion of rampant consumerism, and wasteful and irresponsible use of resources.

Incineration seems to indicate that waste is being "*managed*": Incineration is a burn technology. When mixed waste is burnt in an incinerator it gets converted to ash. However, it does not disappear completely as the incinerator promoters would have us believe. Further, they claim that the quantity of the ash is miniscule compared to the amount of waste. This is not true! Bottom ash or the solid residue that is left after the mixed waste is burnt is about 30 per cent of the original weight of the waste and occupies about 40 per cent-50 per cent of the space that compacted unburnt waste would generally occupy.[5]

Incinerators do away with consumer and producer responsibility to minimise waste generation. In a way it legitimises the generation of waste

Even though it seems that a large volume of waste has been reduced to mere ashes, the process of burning itself releases deadly toxins in the air and the solid residue of ash left behind is a concoction of highly toxic heavy metals and dioxins and furans. Moreover, the ash still needs to be disposed in a specially designed landfill. It is now a well-known fact that all landfills eventually leak and it is highly likely that these toxins in the ash will leach into the groundwater beneath. Also in the ash form, the toxins are more likely to leach than from the unburnt waste. According to the EU, leaching from landfills might be one of the most important sources of dioxin in the future.[6]

The truth is that incineration converts a solvable problem into a non-solvable chemical problem.

Incineration promotes unfettered consumerism, wasteful and irresponsible use of resources: Incinerators do away with consumer and producer responsibility to minimise waste generation. In a way it legitimises the generation of waste. Since huge amount of waste is needed to keep an incinerator functioning. For example, "to remain competitive in the solid waste disposal market, Fairfax County, Virginia, USA, has had to import trash from surrounding counties to meet the revenue requirements of its waste-to-energy facility."[7] Recently, in Chester, Pennsylvania, USA, a local company—American Ref-Fuel Co., which operates the Delaware Valley Resource Recovery Facility in the city has acquired a local commercial waste hauling company to ensure a steady flow of trash to its waste-to-energy plant in Pennsylvania.[8]

Manufacturers in an attempt to make their products more marketable use excess packaging. Packaging has a limited role once the product begins its life and no role after the product is disposed. Thus the amount of waste produced per product increases. Incinerating the waste makes the producer believe that they can use extra packaging without paying for the production of waste.

Suggests viable and clean energy recovery from waste: One of the most lucrative solutions being promulgated by the incinerator promoters is its potential to generate energy from waste that too clean renewable energy. This is a myth! It is economically nonviable, environmentally unsafe and poses health risk to all living beings!

It takes Rs 8 crores to convert 150 tonnes of waste into 1 MW power, while 500 tonnes of waste can be turned into compost with Rs 3 crores

A classic claim made by the proponents of incinerators is that heat generated from burning of waste can be used to create electricity, which is renewable energy as it can replace equal amount of electricity to be generated from a fossil fuel-based power plant. However, the truth is, electricity generated from waste incineration is very expensive (2-4 times costlier than conventional energy) and it also burns fossil fuel in the form of plastics, which is petroleum-based product and has a high calorific value. To recover energy from a waste stream efficiently, waste with high calorific value is required. Which means waste like plastics as well as fuels are needed for energy recovery. Therefore, it is not entirely true that energy from waste is renewable energy.

Apart from the calorific value of the waste, the efficiency to recover energy from the waste is also a critical factor. The level of efficiency for energy recovery in incinerators compared to the potential energy present in the waste is very low. As a thumb rule, according to the Indian Ministry of Non Conventional Energy Sources (MNES), 150 tonnes of municipal solid waste would generate 1 MW of electricity.

Timarpur waste-to-energy scheme in Delhi

A waste incineration-cum-power generation plant was installed in 1984 by the Department of Non-Conventional Energy Sources (now Ministry) and the Ministry of Energy with technical support from a Danish firm. The capacity of the plant was 300 tonne of garbage per day and was supposed to generate 3.5 MW electricity per day. The facility did not work.

The reasons given were

- **Low calorific value of waste (600-800 k Cal/Kg) when the needed value lies in the range of 1400 k Cal/Kg. (which results in low furnace temperature)**
- **High moisture content (which results in low furnace temperature)**
- **Presence of inert materials (like sand and grit) in the waste (which results in low furnace temperature)**
- **Presence of non-volatile garbage**

Indian waste has these peculiarities - it has mud and sand in it, it has a high degree of moisture and it consists of a lot of biodegradable matter that has moisture in it.

It is no wonder that such schemes have failed and will continue to do so.

It is paradoxical that incinerator promoters are trying to recover energy from waste by destroying material whose extraction and processing requires a lot of energy, which by recycling and reusing can be saved to a greater extent. To manufacture a tonne of aluminium cans from virgin bauxite ore takes about five times as much energy as producing a tonne of recycled aluminium cans, not considering the severe impact on the environment due to bauxite mining. According to a Canadian study, "on an average, recycling saves three to five times as much energy as is produced by incinerating municipal solid waste."[9]

In terms of environmental costs, which is often not taken into consideration while calculating the costs of energy recovery from incineration, Friends of the Earth, UK, has compared the amount of carbon emission, major contributor to the global warming, from incineration versus

Incineration shifts the burden of responsibility of waste from the producers and the consumers to those who have very little to do with the waste problem. In India, there is a huge disparity in per capita waste generation between lower and higher income groups that ranges between 180 to 800 gm per day

recycling and composting of household waste. It estimates that up to 4.5 million tonne of carbon emission can be saved each year by recycling and composting of household waste as compared to incineration with energy recovery. According to the report "Beyond the Bin, 2000", recycling 20 per cent of municipal solid waste reduces the cost of environmental damage by as much as £200 per tonne (approximately Rs 13,200) [10].

Toxins released from incinerators with energy recovery, where mixed waste is burnt, pose health and environmental risks that will impact not only the present but future generations.

In a way, incineration shifts the burden of responsibility of waste from the producers and the consumers to those who have very little to do with the waste problem. In India, there is a huge disparity in per capita waste generation between lower and higher income groups that ranges between 180 to 800 gm per day.[11] But the disposal of waste through incineration burdens all sections of the society equally in terms of financial and environmental costs, notwithstanding who the generator of waste is.

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5. How to Win campaign against incinerators. Friends of the Earth, UK. 2000. Pg. 17.
6. Ibid.
7. Tod Robberson, "Trash Shortage Could Lay Waste to Area Budgets," Washington Post, 4 February 1997. (Referenced in Exploring Environmental Issues: Municipal Solid Waste, American Forest Foundation, US, 1997. Pg. 5. http://www.plt.org)
8. Neil Tangri, Essential Information, USA.
9. Ibid. Note 5. pg 19. (Recycling versus incineration, 1992. Sound Resource Management Group Inc.)
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11. Srishti and TERI study, 1996.

Truths about incineration

Some facts to remember while embarking on an anti-incineration campaign.

Truth no 1: Incineration demands creation of waste - it encourages waste production.

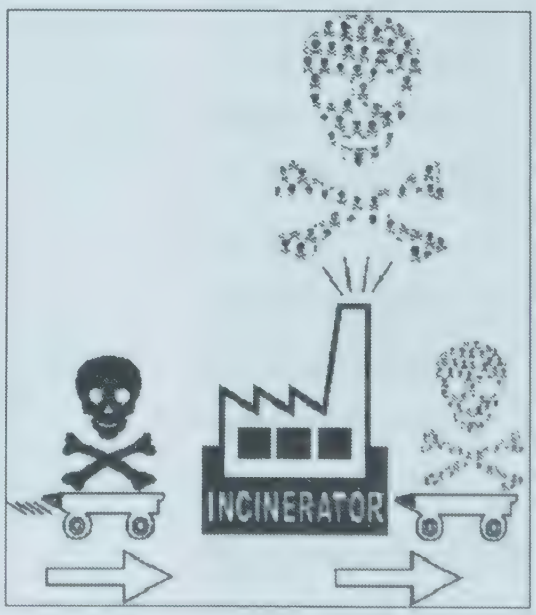
Reason: Incineration completely destroys attempts to reduce, recycle and reuse waste because a lot of waste is required to ensure that the incinerator operates. The incinerator also removes responsibility of the waste creator to collect, reduce, and recycle the waste as the waste is burnt.

Truth no 2. Incineration destroys resources.

Reason: A commodity becomes waste when it is of no value to a consumer. However, the material from which the commodity is made is a resource that still has plenty of use. Incinerating the waste will not give any chance for the material to be reused in another form. Thus resources are lost. For example, plastic containers, paper envelopes and bags can be further reused.

Truth no 3: Incineration is not final disposal it requires landfills.

Reason: The ash from incineration is very toxic as it has contaminants ranging from heavy metals (lead, mercury, cadmium) to organochlorines (dioxin and furans). Disposing this waste requires an engineered landfill, which will again cost crores of rupees. If the ash is disposed in ordinary municipal dumps, the heavy metals in the ash will leach into the ground water and also the ash can blow in the wind and disperse on land and water bodies.



Truth no 4: Incineration produces toxic ash and smoke.

Reason: Incineration is a chemical process where heat reduces the waste into its chemical constituents. Some of these chemical constituents are highly toxic or can react with one another to form toxic chemical compounds that are released in the gases or in the ash.

Truth no 5: Incineration is a very expensive technology.

Reason: Waste incineration is a very costly technology as the pollution control devices cost crores of rupees. If the technology installed is for a few lakh of rupees then the technology is being subsidised at the cost of health and environment.

Truth no 6: There is no such thing as eco-friendly incineration.

Reason: Around the world, incineration as a technology to manage waste is being abandoned due to health-related and environmental problems associated with it.

"Approximately 71 per cent of all quantifiable environmental releases were dominated by air emissions from just three source categories in 1995: municipal waste incinerators (38 per cent); backyard burning of refuse in barrels (19 per cent); and medical waste incinerators (14 per cent)"
—US EPA's Draft Dioxin Reassessment, Sept 2000.

Truth no 7: Incineration is energy-intensive.

Reason: Incineration is a thermal process. To generate heat fuel is used. For instance, calorific value for Indian waste is around 600-800 k Cal/Kg. Whereas, to generate energy, the minimum calorific value needed is 1200- 1400 k Cal/Kg. Therefore extra fuel has to be added to generate viable energy from incineration.

Truth no 8: Incineration will destroy livelihood of thousands of people.

Reason: Waste consists of biodegradable and non-biodegradable waste. The non-biodegradable waste has an economic value even after it is thrown out. Occupation and livelihood of a whole informal sector comprising of ragpickers or *kabariwallahs* (scrap dealers) and recyclers depends on this waste. Incineration destroys the source of livelihood of this sector without providing for a safer alternative.

Truth no 9: Energy from incineration in non-renewable.

Reason: Waste is considered as a source of energy because of its calorific content. Its constituents like plastics, paper, metal and other organic material contribute to the calorific content of waste. All of these are recyclable and are derived from non-renewable sources.

Truth no 10: Incineration does not completely burn all the waste.

Reason: High temperatures are required to ensure that the entire waste is completely burnt. But the Indian experience shows that these high temperatures are never achieved because of the problems in design and operation. Waste comprises of different material including metals that may have high melting points. Also heat may not fully reach the waste that is piled inside the chamber. Thus portions of the waste do not come in contact with high temperatures.

Hazards of medical and municipal waste incineration

1. **Incineration is a complex technology** that creates a new set of chemical toxins, some of which according to current research, are super toxic even in extremely small quantities.

2. **The problem of waste is not of quantity but of its nature.** Estimates say that the total quantity of medical waste, in say a city like Delhi, is about 60-80 metric tonne in the total municipal waste stream of 7000-8000 metric tonne. This is about 0.7-1 per cent. It is however the 10 per cent infectious part of the medical waste that is of concern and the rest 90 per cent is non-infectious. Segregation is the key to proper medical waste management, not incineration.

3. Some of the **toxins produced during incineration** (both medical and municipal) are *i) acidic gases, ii) dioxins and furans and iii) heavy metals*

- *Acidic gases* like nitrogen oxide that has been known aid in acid rains and attack the respiratory system, the cardiovascular system and the lungs. Hydrochloric acid, formed during burning of plastics, attacks the respiratory system, skin, eyes and lungs displaying side effects like coughing, nausea and vomiting. Plastics form a substantial part of the infectious waste in the medical waste stream.
- *Dioxins and furans* are the most potent toxins known to human kind. According to United States Environment Protection Agency (USEPA) recent "Dioxin Assessment Report", dioxins are human carcinogen and the risk of getting cancer from dioxin is 10 times higher than as reported by USEPA in 1994. They are also known as endocrine disruptors. Dioxin and furans are released during burning of chlorinated material like PVC.
- *Heavy metals* are released during incineration of medical waste especially from mercury when incinerated. The vaporisation process breaks down metals into tiny particles that are more easily ingested and more toxic when mixed with other chemicals
- *PCBs (Poly Chlorinated Biphenyl)* are closely related to dioxins in structure. PCB is an organochlorine that is persistent and extremely toxic. It is one of the 12 Persistent Organic Pollutants that are being globally banned. Mothers who are exposed to PCBs during pregnancy are reported to have given birth to children with lower birth weight, head circumferences and IQs.

4. **International regulations:** In the United States, a dioxin risk assessment -"Estimating Exposure to Dioxin like Compound, Vol II, Office of Research and Development, EPA/600/688/005Cb, 1994", carried out by the US Environmental Protection Agency (USEPA). **It stated that dioxin was toxic even in very low concentrations, as low as 0.006 picogram (one trillionth part of a gram) per kilogram body weight per day.** This comes to 0.42 pg of dioxin per day for a 150-pound adult. Dioxins enter the body through fatty foods such as meat and diary products such as chicken, egg, meat, milk etc, as they are fat-soluble. In the UK, the Department of Environment (DOE) estimates that the average daily consumption is up to 500 times the EPA limits. The EPA report also stated that **medical waste incinerators were the highest source of dioxins** in the US.

"Dioxins, furans, and mercury are examples of persistent pollutants for which incinerators have contributed a substantial portion of the total national emissions. Whereas one incinerator might contribute only a small fraction of the total environmental concentrations of these chemicals, the sum of the emissions of all the incineration facilities in a region can be considerable"
–Excerpts from the US National Research Council's "Waste Incineration and Public Health", 2000.

The problem of waste needs a systematic approach, with investments in training, in segregation, waste minimisation and safe technologies

where of a total of 9,300 TEQ (Toxic Equivalency Quotients) 5,100 were contributed by medical waste incinerators.

5. **No testing facilities** for the dioxins and furans are available any where in India. The cost for dioxin analysis ranges from US $1,000 to US $3,000 per sample[12]. The cost of establishing such a laboratory is estimated at US $1.5-2 million [13] and moreover India or any other developing countries do not have the facility to test dioxin.

6. Countries like **India have chosen a dioxin preventive route,** albeit in adequately as is evidenced from regulations, which prohibits the burning of chlorinated plastic and compounds. As per the Municipal Solid Waste and Biomedical (Management and Handling) Rules burning of chlorinated plastics (PVC) is prohibited. However in absence of any labelling requirements of plastics, the usefulness of this aspect of the rules is limited. PVC is used for a wide range of products such as packaging, toys, hospital products, electrical wire coating, home furnishings, blood and urine bags, IV tubes etc.

7. The USEPA proposed new standards on Medical Waste Incinerators on September 1998 Federal Register (60 FR 10654). Under the new regulations, **USEPA predicts 80 per cent of the present on-site incinerators will be shut down** and an alternative method for disposal will have to be sought.

8. **Regulations for incinerators (for medical and municipal waste)** have been set up with the Central Pollution Control Board.

9. **Incinerators are difficult to run:** In hospital environments, technologies like incineration fail because untrained janitor staff runs them. Srishti surveys show that most incinerators (over 85 per cent) run at incorrect temperatures, do not destroy the waste, need a lot of fuel to run, and are often out of order.

References:

12. Schecter, A., 1998. A Selective Historical Review of the Congener-Specific Human Tissue Measurements as Sensitive and Specific Biomarks of Exposure to Dioxins and Related Compounds Environment Health Prospect 106 (Suppl. 2):737-742
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Pollution control equipment in Indian incinerators and their problems

Incineration is a chemical process in which waste is broken down into its constituents and where the constituents can form new chemicals. To ensure that these pollutants do not escape during the incineration process pollution control devices are added.

However even though an incinerator may have one or the other pollution control device some of the things that should be remembered are:

- Most of the toxic pollutants are formed during the warming and cooling down of the incinerator.
- A pollution control device does not stop or reduce the creation of pollutants. It only prevents (to a limited level) the release of pollutants into the atmosphere.
- A pollution control device collects the pollutants either in the ash or in the air filter.
- Pollution control devices (scrubbers, filters) become hazardous waste as they get contaminated with the pollutants.
- Pollutants in the devices, although not present in large quantum, are highly toxic.

A company that abandoned plans to build California's first hazardous waste incinerator will not attempt another such project in the near future because excessive regulation has made incineration "a dead technology". Since Security Environmental Systems (SES) six years ago proposed building an incinerator in Los Angeles neighbourhood of Vernon, the company spent more than $4 million fighting the state's environmental and health agencies, two court and a local advocacy group.

–Hazardous Waste News 1991.

POLLUTION CONTROL DEVICES AND THEIR PROBLEMS:

■ ***Exhaust fans***

As the name suggests, it is just a fan, whose sole purpose is to inject air.

Problems: This is not a pollution control device. It just decreases the concentration of pollutants in the smoke by bringing in large volumes of fresh air. This also lowers the temperature of the smoke.

■ ***Wet Scrubber***

In this technology fumes are passed through water.

Problems: Though water soaks some pollutants, not all of them are caught by this technology. Further the water has to be treated because of the pollutants in it.

■ ***Dry Scrubber***

In this type of pollution control equipment, lime is used as a filter. Smoke is passed through lime so that the lime filter absorbs contaminants.

Problems: The lime in the filter has to be replenished at frequent intervals. As lime is contaminated with a variety of pollutants it has to be treated as hazardous waste, which needs to be disposed in hazardous waste landfills.

■ ***Electrostatic precipitators***

An electrostatic precipitator creates an electrical charge close to the smokestack. This ionises the particles in the smoke. The particles either stick together and fall into the ash catchment area or stick to the precipitator.

Pollution control devices do not get rid of pollutants; they merely displace them from one medium to another

Problems: The nodes of the precipitator have to be cleaned frequently as the particles on them decrease their efficiency. Incinerator operators and cleaners are exposed to high levels of toxic ash while cleaning the nodes.

- ***Bag House Filter***

A bag house filter is similar to the bags used in vacuum cleaners. There are a series of such bags, one after the other, with decreasing pores to captures particles.

Problems: The old bags have to be treated as hazardous waste because of the types and quantities of contaminants in them.

- ***Gravity settler***

Gravity settler is like an enclosed cyclone. The smoke is passed through a cyclone of air. This sucks all the smoke so that all the heavy particles collect in a receptacle.

Problems: Pollutants collect in the receptacle of the settler and have to be dealt with as hazardous waste.

- ***Dilution equipment***

Dilution equipment is a set of blowers that inject large quantities of air into the smoke so that the concentration of the contaminants in the smoke decrease.

Problems: The levels of pollutants released does not decrease.

EQUIPMENT REQUIRED FOR CONTROLLING SOME POLLUTANTS

- ***Volatile organic controls***

Volatile organics can be controlled only with good combustion practises. By controlling combustion air, waste feed rate, combustion temperature and residence time of the waste.

- ***Nitrous oxides (NOx) control***

Selective non-catalytic reduction (SNCR) is the most common method used. Ammonia is injected into the combustor boiler bank above the fire zone. Ammonia reacts with the nitrogen in the combustion gases to form nitrogen dioxide and water.

- ***Acid gas controls***

Acid gases can be controlled by having them scrubbed off from combustor exhaust gases. The scrubber is either a dry powder or a liquid.

In the US, a spray-dry scrubber is used. The flue gas from the combustor is fed into a reactor vessel, where it is sprayed with a lime slurry, which forms a calcium precipitate. The slurry water cools the incoming combustor exhaust and the water gets vaporised.

- ***Particulate controls***

These are controlled by fabric filters or bag houses. Bags are placed one after the other with smaller pores. As particles get trapped the pores decrease in diameter increasing the efficiency of the filters.

How do contaminants reach the human body?

The waste that is fed into the incinerator, burns. The heat breaks down some of the waste into their chemical constituents. These constituents either react amongst themselves to form new chemicals or remain in their original form.

The chemicals escape along with the smoke via the smokestack, with the flue gases or in the ash.

Ash:

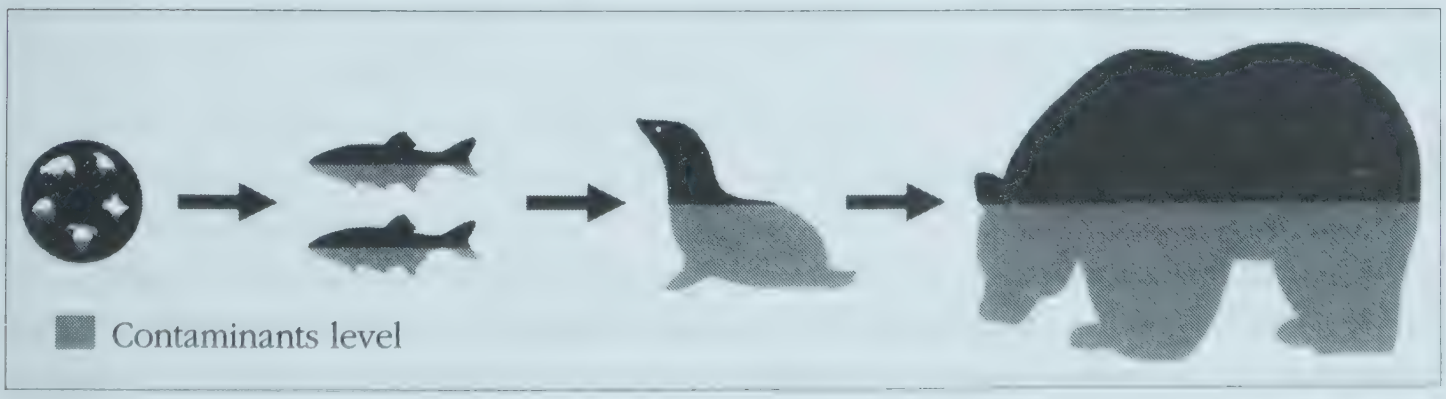
The ash is taken to a dump yard where it is disposed. The contaminants like heavy metals in the ash can either leach into the soil or the ash is carried by the wind and deposited on land, vegetation and water bodies. Animals during foraging on vegetation ingest this contaminated ash.

Humans then consume animal products (for example, milk, meat).

Smoke:

Smoke is carried to long distances by wind. When smoke particles settle down they are consumed during the process of ingestion. This begins with the smallest species, which are then consumed by the larger species and this continues till the top of the food chain. Thus in every point of the food chain the toxic pollutants from the incinerators are consumed. The levels of intake increase with the size of the animal as it corresponds to its appetite and quantity of consumption of the smaller species.

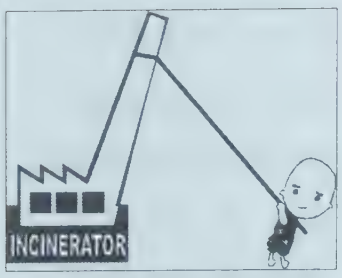
This is called **biomagnification.**



"After pollutants from an incineration facility disperse into the air, some people close to the facility may be exposed directly through inhalations or indirectly through consumption of food or water contaminated by deposition of the pollutants from air to soil, vegetation, and water... Persistent pollutants can be carried long distances from their emission sources, go through various chemical and physical transformations, and pass numerous times through soil, water, or food"

–Excerpts from the US National Research Council's "Waste Incineration and Public Health", 2000.

How to start a local campaign



Installation of incinerators involves various stakeholders - the decision-makers and the local community. While the municipalities, hospitals and the pollution control boards decide, communities living near the vicinity of the incinerators and the ones who deal in waste - like rag pickers, and waste recyclers bear the brunt of the decision.

Therefore a campaign should be focused on those immediately concerned with the decision to install an incinerator and those directly affected by this decision. While the focus is local, the campaign will have a more broad-based repercussion. Keeping this in mind, it is therefore necessary to involve higher authorities of the governing bodies that usually have their offices at the respective state capitals.

CAMPAIGN GOALS

The campaign should have a clear goal so that the work is focused and the information that is required and generated is related to the campaign. The goals of the campaign can be both short and long-term.

A campaign can be Preventive, Anti or Remedial.

Preventive - In such a campaign the goal is to pre-empt any plan to install an incinerator, while suggesting alternatives to manage the waste produced.

Anti - Such a campaign usually starts after incinerator proposals have been passed or have already been installed. This is a very tricky situation when viable alternatives will have to be suggested in tandem with the demand to shut down the incinerator.

Remedial – A remedial campaign is an attempt to bring to notice the fact that the waste management device that had been installed has failed. This must be accompanied with viable alternatives.

MAJOR STEPS

Identifying your allies

To run successfully, a campaign must have participation from the major players in a community. It is therefore necessary to bring more people/groups into the fold. Some of the people/organisations that should be involved:

- Residents' associations living near the proposed site
- Workers' unions
- Media
- Mahila mandals (women's organisations)
- Other NGOs working in the fields of urban development, waste, pollution, health etc
- Prarthana Sabhas (religious associations) in that area

As a campaign has various phases, it is necessary that work be defined and delegated. The various tasks will include researching, meeting with officials and other people and groups concerned, meeting the press, generation of funds, creation of information handouts, organising demonstrations or signature campaigns. Work should be fanned out and those responsible for different sections of the campaign should have regular meetings to ensure that everyone is kept up to date and function in tandem.

Another important ally to a campaign is the elected representative of an area. Communities and campaigners should not shy away from using their elected representatives to demand their rights. With the elected official on your side it will be easier to meet various officials in the government.

However what should be remembered is:

- Do not let the politician make it a political issue to benefit any particular political party
- Do not let the politician co-opt the campaign
- Do not let the politician become the spokesperson for the issue
- If the politician addresses a press conference on the issue, make sure s/he has enough briefing to take the issue to the community

"…. decision makers should think carefully before authorising new waste incinerators, since any new plant built now would still be operating in 2020, and would stifle development of new forms of waste handling."
– Ludwig Kraemer, Head, European Union Waste Management Directive, 2000.

Information gathering

Before any campaign is initiated it is essential to find out exactly what is being proposed and the current stage of the proposal. Though not all stages of a proposal are open to public pressure or influences, but it's worth an effort to target around the policy setting stage.

This is the stage when plans for waste disposal strategies are being worked out in the municipalities and are more often than not influenced by the national waste plan or policy decisions taken at the national level. For instance, in India, the MNES has been promoting energy recovery from municipal and industrial waste. This has influenced the plans of municipalities around the country in how they manage waste, technology transfers and waste management companies from the Western countries.

At this stage it is necessary to ask the implementing agency the following questions:

1. What is the type of technology to be used?
2. What is the daily waste consumption of the plant?
3. And if it is an energy recovery project then how much electricity will be generated?
4. What are the installation cost and the running cost of the plant?
5. What is the percentage of organic and inorganic content in the city garbage?
6. How will it be ensured that no contaminants (heavy metals, PVC etc.) enter the process?
7. What kind pollution control equipment is being fitted?
8. What kind of tests are to be carried out during the operation of the plant and what would be their frequency?
9. What permits has the company taken from the Pollution Control Board?
10. What does the residual char and gas consist of? How will they be disposed off?
11. What is the track record of the company proposing the new facility and where else has it installed similar plants? Have they ever been prosecuted for breaching environmental licensing conditions, either here or overseas?
12. Where else in the country/world has this technology been used?
13. Will the data on releases into the environment be accessible to the community?

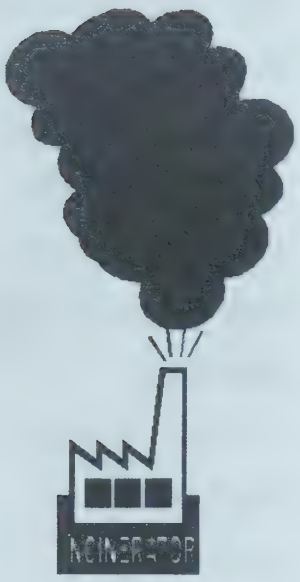
Where to look for information on installation of incinerators?

A major problem with getting information about installation of new incinerators or even about

the existing ones is that of finding the source of information.

A couple of places to look for information:

- All the purchases are made as per tenders that come out in the newspapers. It is therefore a good idea to keep a watch on the tender page of the newspapers.
- Municipalities, hospitals and the local pollution control boards. Regular meetings with concerned officials of these agencies is an effective way to determine plans to install incinerators.
- Information on existing incinerators can be found in incinerator manufacturer brochures.



How does one locate an incinerator?

Incinerators can be found in most large hospitals. These are usually at the back of the hospital. The incinerator is placed inside a large shed that has an open area to store the waste and the ash. Outside the shed are the fuel tanks and smoke stack.

Municipal waste incinerators can be found close to a municipal dump at the outskirts of a city/town. They would usually be called a waste management facility.

The best way to locate an incinerator is to look for a smoke stack.

How to determine the make and manufacturer of the incinerator?

The premises of the incinerator will have a signboard where some information will be given. Also the control box of the incinerator will have details of the incinerator. More information can be got from those working at the incinerator facility and those living close by.

How does one determine the kind of waste that go into the incinerator?

A lot of waste will be kept close to the incinerator before it is burnt. It is at this place were different types of waste can be identified. Incinerator operators at the facility can also share the information.

What are the other points to look at in an incinerator: ash and smoke?

Incinerator ash will be either found at the side of the incinerator building or behind it. In some cases it may be dumped in a municipal bin close by (in case of hospitals), ash from a municipal incinerator will be sent to the municipal dump.

The ash should be assessed for the following points:

- Presence of unburnt contaminants
- Heavy metal content in the ash. Scientific analysis of the ash would have to be carried out, costing a few thousand rupees in a research laboratory. Alternatively, science departments of universities and institutes could be requested to conduct a sampling.

Other information

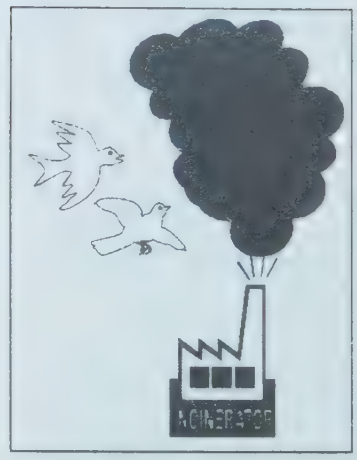
It is very necessary to collect data on scientific studies showing the problems of incineration, the kinds of pollutants and their effects on the human system. It is also necessary to get data on past cases where incinerators have been shut down and replaced with cleaner alternatives.

What should you do with the information and why?

The information being generated is for one purpose - to show that incineration is not the solution to the waste problem. It pollutes the environment and people are exposed to different pollutants released during burning of waste.

Thus this information should be disseminated widely in simple language to:

- the press with a brief backgrounder about the problem of waste management in the town/city.
- decisionmakers with a letter about the adverse impacts of incinerators. The letter should ideally suggest some alternatives.
- other NGOs for support.



WHOM TO CONTACT:

For municipal waste incinerators

Municipal Commissioner
Municipal Health Officer
Chairperson of the State Pollution Control Board
Regional representative of the Central Pollution Control Board
Environment Secretary (state and centre)
Ministry/Environment Minister (state and centre)
Other NGOs
Media/Newspapers

For medical waste incinerators

Director and Superintendent of the hospital
Regional representative of the State Pollution Control Board
Environment Secretary (state and Centre)
Environment Minister (state and Centre)
Chairperson of the State Pollution Control Board
Other NGOs
Media/Newspapers

HOLDING WORKSHOPS

Workshops are an effective way to disseminate and share information, build capacity and get people on your side. The workshop can be structured according to the people targeted. Campaigners can hold workshops for other NGOs to share information with them and tell them about the problems of incineration. In this workshop with NGOs, campaign strategies should be discussed along with the possibility of delegation of responsibilities. Small workshops can also be held for officials who are involved in waste management to familiarise them about cleaner waste management systems and the problems associated with incinerators.

WORKING WITH THE MEDIA

The press is a very important ally of a campaign and can ensure:

- Proper coverage of the problems of incineration
- To bring it to the notice of the whole community and ensure that waste management becomes a serious issue

Mailing list

It is necessary to create a mailing list of journalists. Collect the names, addresses, faxes, phone nos, emails of journalists who cover environmental issues. Journalists can be requested to write features on the subject.

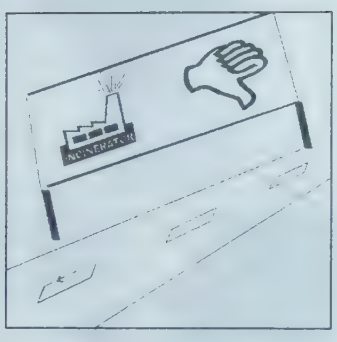
Press releases

A press release is a method of sending out information to the media on behalf of your organisation or coalition. The information in the press release should always be brief, concise, recent and to the point highlighting the problem. A return address and phone number should be provided at the bottom of the press release. A follow up call should be made after sending the press release to ensure that they have received it.

Press conferences

Press conferences are a method to share information with several members of the media at the same time. Although speakers normally speak at the conference to create awareness, one should also prepare an information packet giving details of the findings, the reasons why the information was gathered and the charter of demands, to enable the press to take note of the issue. Photographs too can be provided in the information packet.

Advertisements



Advertising is indeed a very effective way, although expensive, of ensuring that the message reaches a wider audience. Advertising does not only have to be in major national newspapers, they can also be placed in the vernacular press.

Sustaining a campaign

The trickiest part to a campaign is to not let it die midway. There is need to have sustained pressure on the people who have taken the decision to install an incinerator or who have already set up an incinerator to do away with it and think of alternatives. Also there is need to keep the campaign in public focus. To do this one should enlist the help of the public and other NGOs to a large extent.

Campaigners can also:

1. Start a signature campaign.
2. Start a door-to-door campaign.
3. Request people to write or phone concerned government officials.
4. Form small groups of people who can maintain vigil and protest around incinerators.
5. Take small group of representative from the community where the incinerator is going to be installed or has already been installed to meet the authorities.
6. Have public debates on the issue.
7. Send out information to people who are most affected.

Demolishing false arguments

When a community is fighting against the installation of incinerators it is faced with two sets of opponents - the decision-making body and the people who are ordering and installing the incinerator.

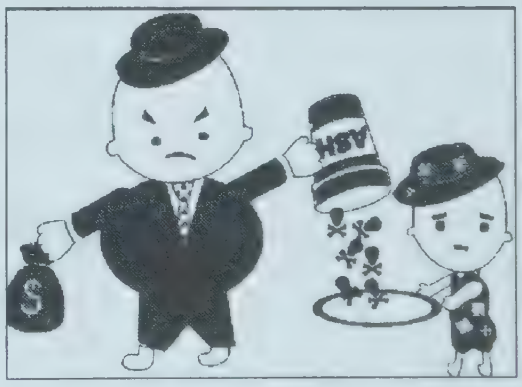
Of these two, the people who have ordered and are installing the incinerator would have made a strong case for its installation. The decisionmaking body in most cases are not very knowledgeable about the process and are often swayed by the industry arguments.

ARGUMENT NO 1: INCINERATION DECREASES THE VOLUME OF WASTE BY 80 PER CENT-90 PER CENT.

Counter-argument: The statement is a half-truth as it refers to a comparison between the waste entering the incinerator and the ash that comes out. The statement does not refer to the waste that cannot be burnt or the waste that is not incinerated when the facility is closed for repairs or over-hauling.

ARGUMENT NO 2: WE DO NOT HAVE TO BOTHER ABOUT POLLUTION, AS WE ARE A DEVELOPING ECONOMY.

Counter-argument: The argument is based on the Western model of growth and suggests that developing countries should make the same mistakes that the developed nations have made.



The process of incineration is essentially a chemical one as it uses high temperature to breakdown waste into its constituents. This releases new chemicals that are toxic or can react to form toxic materials. The ash can also get contaminated by these by-products. The smoke too will contain soot contaminated with these particles. The releases from the smokestack will contain chemicals released and/or formed during the burning of the waste.

Unburnt waste or partially burnt waste will be present in case the process is not properly carried out.

ARGUMENT NO 3: THE INCINERATOR IS BEING INSTALLED TO COPE WITH FUTURE AMOUNTS OF WASTE.

Counter-argument: Instead of trying to find ways to reduce the amount of waste produced, money is being spent on installing an incinerator. If waste is managed in a manner that involves cleaner systems like composting, reduction and reuse as well as collection and recycling there will be no need to install expensive and polluting technologies such as incinerators.

Moreover, the incinerator will run under capacity because of insufficient waste and will require high maintenance costs.

Also by installing an incinerator we would be:

- Living in a world of false security thinking waste is being managed.
- Encourage more future and current waste production.
- Ignore the current situation to create a problem in the future.
- Avoid attempts to improve the waste management system in a clean manner immediately.
- Destroy resources meant for future generations, like trees, metals and minerals, oil.

COMMUNITY HEALTH
LIBRARY
AND
DOCUMENTATION
UNIT

" We know nothing about most of the chemicals produced, and right now they are considered harmless until proven dangerous. We are being killed by our own ignorance"
–Joe Thronton, scientist, Columbia Earth Institute.

ARGUMENT NO 4: SETTING UP AN ALTERNATIVE SYSTEM WILL BE VERY EXPENSIVE.

Counter-argument: The reason why an alternative system will be termed as 'expensive' is:

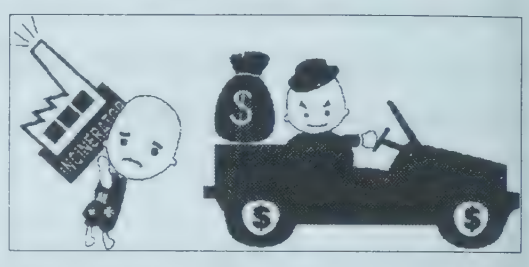
- The waste generators will have to pay for waste management.
- It would involve the participation of all members of society.
- It would involve revamping the existing system that till date collected and burnt the waste.
- Would involve specific cleaner technologies for managing different types of waste.

Any sustainable waste management scheme will have to involve waste producers who would have to pay for the waste they generate. This would mean that every one takes responsibility for the waste they generate. Thus there would be disincentives to waste producers, which in turn would mean that less waste would have to be managed.

Maintaining a modern incinerator can be one of the most expensive facility that a city has to maintain.

ARGUMENT NO 5: INCINERATION IS A CHEAP AND ECONOMICAL WASTE MANAGEMENT METHOD.

Counter-argument: In India incineration is cheap because the types of incinerators installed do not have any technological sophistication to ensure less pollution and proper temperatures.

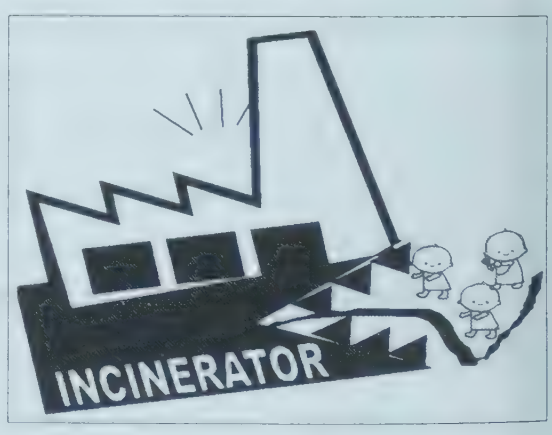


In other countries like the US almost half of the cost of the incinerator is for the pollution control devices. The costs of these incinerators run into hundreds of millions of dollars.

These pollution control devices become necessary because of the variety of emissions from an incinerator and their toxicity. The economics of incineration hide the price to our health and environment.

ARGUMENT NO 6: INCINERATORS WILL CREATE JOBS.

Counter-argument: Waste consists of biodegradable and non-biodegradable constituents. The non-biodegradable waste is collected by the informal waste collection system. This system involves ragpickers, *kabariwallahs* and small-scale recyclers. This system involves over a lakh of people in Delhi alone. If an incinerator is installed these people will lose their jobs.



ARGUMENT NO 7: THERE WILL NOT BE ANY MORE WASTE LYING IN THE STREETS.

Counter-argument: Incineration will not improve waste collection. Waste collection depends on availability of waste collectors and waste receptacles. Thus incineration does not guarantee that all the waste will be removed. Waste collection efficiency in Indian cities ranges from 50 per cent to 90 per cent.

ARGUMENT NO 8: INCINERATORS WILL GENERATE ENERGY.

Counter-argument: Energy generation from waste is only viable if there is substantial calorific value in the waste. Optimum calorific value for generating electricity from waste is around 1,400 Kcal. However the calorific value of Indian waste is between 600 to 800 kcal/Kg.

The composition of waste is shown in the table below:

(percentage)

Popln. Range in lakh	Kitchen waste/ Compostable	Rubber, leather and synthetics	Paper	Others material (glass, metals, inert)
1 -5	44.57	0.78	2.91	44.48
5 - 10	40.04	0.73	2.95	49.26
10 - 20	38.95	0.71	4.71	45.68
20 - 50	56.67	0.48	3.18	41.07
50 and above	30.84	0.28	6.43	54.74

***Source**: NEERI report*

The above table provides the composition of waste for towns/cities with different populations. It is seen that inert and compostible material forms the major part of the waste. Thus instead of generating electricity the waste will need energy for it to burn.

Argument no 9: No more land space.

Counter-argument: Incineration will require construction of engineered landfills to dispose off the toxic ash. Thus incinerators do not substantially decrease the demand for land.

Argument no 10: Pollution control devices are being installed.

Counter-argument: The pollution control devices prevalent in India for medical waste reduce the pollutants like SPM (suspended particulate matter), NOx, and SOx from the smoke. Other contaminants like heavy metals, dioxin and furans cannot be controlled as the pollution control devices for these costs crores of rupees.

Argument no 11: The temperatures will be high enough to ensure that no contaminants are created.

Counter-arguments: There are two types of incineration – batch-fed and continuous-fed incinerators.

In a batch-fed incinerator certain amount of waste is regularly fed. When the waste is fed the temperature inside the chamber immediately reduces - creating conditions for formation of contaminants like dioxins and furans.

In a continuous-fed incinerator the temperature inside the chambers will not be very high as the waste is continuously fed - thus pollution levels in this type of incinerator is high too.

Contaminants/pollutants are also released when the incinerator just starts and when the incinerator is shut down. This is also known as the 'hystersis effect'.

Argument no 12: The test burns show no signs of pollution.

Counter-argument: Test burns are sanitised experiments done in ideal conditions wherein levels of some contaminants are measured. Real world conditions are much different.

Argument no 13: It will be subject to regulatory controls.

Counter-argument: This does not mean that the incinerator will not pollute. It is not possible to maintain a daily check on the pollution levels of an incinerator due to the costs and task involved. Spot-checks are the only mechanism of regulatory control and for a majority of these operations this is not the case.

In the US, most incinerator operators flout the USEPA standards and have to pay heavy fines.

No matter how tough the regulation is, incinerator operators can wilfully flout rules to economise. Also the regulations of contaminants are not on par with the contaminants potency to cause harm.

ARGUMENT NO 14: OUR INCINERATOR MEETS THE USEPA GUIDELINES.

Counter-argument: The most recent USEPA guidelines will ensure that 70 per cent-80 per cent of all small and medium medical waste incinerators fall in line because of the stringent pollution norms being enforced. The other incinerators will have to invest hundreds of millions of dollars in pollution control technology, which will have to be upgraded whenever the USEPA increases the pollution norms.

If Indian incinerator manufacturers state that their incinerators follow the USEPA norms, the incinerators would cost crores of rupees and not just a few lakhs, which is the price of the state-of-the-art incinerators today.

ARGUMENT NO 15: THIS IS NOT AN INCINERATOR BUT A WASTE-TO-ENERGY PROJECT/FLUIDISED BED INCINERATOR/PYROLATOR/GASIFIER.

Counter-argument: All these technologies are burn technologies. Waste is burnt in them generating ash and smoke. The smoke and ash will have contaminants that are highly toxic.

Case studies

It is very important to cite cases where communities or countries have fought and won against incineration. Such cases validate anti-incineration arguments and prove that there is something about incineration that makes governments and people ban it. The cases are not only from developed nations but also from developing nations.

"In France, Belgium, Holland, Italy, Germany and Portugal no more new incinerators are being built because the public will not stand for them. They are treated in the same way as nuclear power stations- people no longer want them"

—Ludwig Kraemer, Head, European Union Waste Management Directive, May 2000.

A. India - Delhi 1996

Supreme Court case (Srishti intervention)

Dr B L Wadhera had filed a Public Interest Litigation against the Union of India about the sorry state of municipal waste management in India. The Supreme Court also took up the issue of medical waste under the same PIL.

The court order initially stated that all hospitals above 50 beds should install incinerators. Srishti intervened in the case and pleaded that hospitals should have a choice of technologies to choose from. Taking cognisance of the intervention and the reports filed with it the Supreme Court changed its ruling to "Either incinerators or any other equally effective alternative can be installed".

Another outcome of this intervention was the creation of a committee to form guidelines for the management of biomedical waste. These guidelines were synthesised and in 1998, the Bio-Medical Waste (Management and Handling) Rules were notified by the Ministry of Environment and Forests.

In 2000, Indian also notified the Municipal Solid waste (Handling and Management) Rules, which bans burning of any chlorinated plastics or chlorine treated waste in the incinerators.

B. Philippines - 1999

The Philippines Clean Air Act

The Philippines government signed into law the "Philippines Clean Air Act of 1999" which, among others, bans incineration of waste.

The new law also provides for the following:

- The Department of Environment and Natural Resources to prepare an annual National Air Quality Status report that will include information on the extent of pollution and the sources of pollutants in the country.
- Banning of incinerators and the prohibition of the burning of municipal, bio-medical, and hazardous waste. This excludes the traditional community or neighbourhood burning of domestic waste.
- The setting of specifications and standards for all types of fuels, additives, substances, and pollutants, like removal and reduction of lead content in gasoline and other fuels by the year 2000. This aims to make all fuel lead-free.
- Another important provision is empowering ordinary citizens to sue officials who are negligent in implementing the provisions of the act.

C. United States of America

There is a prolonged and continuing fight against incinerators in the US. This fight has brought

together many communities and activists. Politicians are also involved in this issue as it concerns the health of their electorate and the environment of their constituencies. For example in an electoral campaign for the President, environmentalists asked the Presidential candidates on their views on incineration. Bill Clinton, who was a candidate, assured voters that he was against incineration.

The USEPA released a set of new operating parameters that will shut down over 70 per cent-80 per cent of all incinerators and cause other incinerator operators to spend millions of dollars in state-of-art pollution control devices.

The most recent victory for the communities was the action taken by communities against the Bronx (New York) medical waste incinerator. Communities maintained vigils, met their political representatives, provided information on alternative technologies. Finally the incinerator was shut down.

D. Japan - 1999

The Health and Welfare Ministry of the Government of Japan announced that it will not allow new garbage incinerators to be built in areas where airborne dioxin concentrations exceed specified limits.

The ministry has reinforced its measures against dioxin pollution from facilities for burning industrial waste and household trash to avoid having many garbage incinerators concentrated in one region. The Health and Welfare Ministry has decided to regulate emissions of dioxin from small-sized incinerators, which are currently free from government restrictions. The decision was made to reach the government's goal set in late March to reduce dioxin emissions by 90 per cent from the 1997 level by December 2002.

The government has been restricting dioxin emissions from larger incinerators to 80 nanograms per cubic meter of discharged gas. (One nanogram is one-billionth of a gram). Larger incinerators refer to facilities that can incinerate 200 kg of garbage or more per hour. The emission standards will be further reduced to 1 to 10 nanograms from December 2002.

However, the government has not imposed restrictions on small-sized incinerators - facilities that can burn less than 200 kg per hour. Pollution experts estimate that companies operate about 17,000 small-sized incinerators throughout the country, releasing more than 300 grams of dioxin every year.

D. Costa Rica

The President of Costa Rica has banned the use of incineration. The ban was promulgated in July 1999.

E. Bans and moratoria on the construction of incinerators

- **In 1985, the Government of Sweden** implemented a two-year moratorium on the construction of all new incinerators.[14]
- **In 1988, the London Convention** passed a resolution requiring the global phase-out of ocean incineration by December 31, 1994.
- **In 1990, in the Flemish-speaking part of Belgium**, public pressure resulted in a five-year moratorium on the permitting of new municipal waste incinerators.[15]
- **In 1992, in the state of Rhode Island, US**, a ban was introduced on the construction of MSW incinerators.[16]
- **In 1992, the Provincial Government of Ontario, Canada**, issued an outright ban on new municipal waste incinerators.[17] In 1996, the new conservative provincial government

overturned the ban as part of their deregulation policy. However, the Ontario recycling industry lobbied to maintain the ban, citing cost savings and profits from reusing and recycling waste. No new incinerator proposals have been announced.

- **In 1992, the City Council of Baltimore, Maryland, US,** passed a five-year moratorium on the permitting of new MSW incinerators.[18]
- **In 1993, in its Combustion Strategy, the USEPA** introduced a federal 18-month moratorium on the instruction of new hazardous waste incinerators. The EPA is authorised to override decisions of State governments to protect human health and the environment. The strategy also imposes new, stricter controls on existing incinerators, boilers and industrial furnaces.[19]
- **In 1994 October, Greece** passed a law on renewable energy and power generation by the private sector declaring it illegal to burn hazardous waste in waste-to-energy plants. However, incineration for municipal and hazardous waste is permitted. Around 15 per cent of all MSW in Greece (3 million tonne per year) is burnt. The Minister of the Environment has voiced his opposition to an incinerator in the Greater Athens area.[20]
- **In 1995 December, Brazil,** the Municipality of Diadema (State of Sao Paulo, Brazil) approved a law banning incinerators for municipal waste. The council stated that the waste problem should be tackled using prevention policies by adopting the 'Reduce, Re-use, Recycle' (3R) hierarchy. In February 1996, the Environmental Council of the State of Sao Paulo discussed incinerators proposals for other municipalities of the State.[21]

PUBLIC OPPOSITION AND VICTORIES

USA: Since 1985 at least 280 incinerator proposals in the USA have been defeated or abandoned due to public opposition.[22]

USA and CANADA: The International Joint Commission, a bilateral political body, recommended that incineration facilities in the Great Lakes region be required to eliminate the production and emission of dioxins, furans, PCBs and inorganic materials, especially mercury and hydrochloric acid, or be phased out.[23]

AUSTRALIA: There have been 10 attempts to site hazardous waste incineration plants in various parts of the country over the last 10-15 years. However, on each occasion they failed, primarily because of community opposition. Australia has no national hazardous waste incinerator, nor any other incinerator that is licensed to burn hazardous waste.[24]

SPAIN: Since 1990, Greenpeace and other public interest groups have stopped 32 incinerator proposals. [25] Demonstrations and petitions calling for bans on incineration have been organised from Madrid to the Balearic Islands. In September 1994, after several years of community campaigns against incinerators the Spanish Minister of the Environment announced that the Spanish government would stop promoting and funding hazardous waste incineration projects. A nationwide Clean Production programme will be introduced to reduce the amount of hazardous waste being generated.[26]

GERMANY: In Bavaria, in 1990, over one million citizens went to their respective town halls during a 12-day period to sign a petition for an anti-incineration law to be put on the ballot. In February 1991, this referendum was narrowly defeated (51 per cent to 46 per cent) in a campaign where the government, alone with incinerator companies, waged an all-out battle to

defeat the initiative. Despite this, the anti-incineration vote won in all the major cities in Bavaria, including Munich, by fairly large margins. The government held on by winning in most of the small villages.[27]

UNITED KINGDOM: Since 1989, there had been eight proposals to build toxic waste incinerators, of which seven have been defeated. The eighth proposal, for an incinerator in Teeside, was given approval by the Secretary of State for the Environment. However, the operators no longer plan to build it as they have decided it is not a viable commercial proposition there being insufficient suitable waste. This follows the phase out of imports of toxic waste for disposal.

In addition, at least seven proposals for hazardous waste incinerators have been defeated and two have been closed. At least four municipal waste incinerator proposals have been defeated, including one in South East London which would have burned 1.2 million tonne of waste a year making it the biggest MSW incinerator in the world. Only one new MSW incinerator, run by South East London Combined Heat and Power (SELCHP) in Greenwich, South London, has been built. Three proposals to burn tyres for energy have also been defeated. Many of the above victories have been achieved with the help of Communities Against Toxics (CATS), a national network of community opposition groups.[28]

POLAND: Since 1990, national campaigns against incineration with local communities have defeated 33 proposals for the construction of municipal, hazardous and hospital waste incinerators. These include: one illegal hospital waste burner that was closed in Warsaw, and two projects for the construction of large regional HZW incinerators. [29] Other prominent campaigns include incinerator proposals in Warszawa (Technical and EMIT, from Italy), Zgierz (Thermoselect from Italy), and Chojnice (EcoSpal).

BELGIUM: In 1995, after activists forced the shutdown of the municipal waste incinerator at Ronse, the Flemish Minister of the Environment declared that it would not be reopened. After years of local protest, Greenpeace activists blockaded the entrance to the incinerator for 12 days. The action had local and regional support, including that of the farmer's union Vlaams Agrarisch Centrum (3,000 members) that had got a dairy cow to participate in the blockade, to drive home the fact that dioxin from the incinerator was contaminating dairy products.

IRELAND: In Northern Ireland, the public overcame political differences to oppose and defeat a proposal by Dupont to site an incinerator at Maydown on the outskirts of Derry. As a result of public protests, the Minister of Environment abandoned the plan for the construction of national hazardous waste incinerator in October 1994. Also, during a meeting with Greenpeace, the Minister of Health stated that hospital waste incineration would soon be stopped.[30]

IRISH COURT CASE Hanrahan v Merck, Sharpe & Dohme: In 1985, Hanrahan, an Irish dairy farmer won damages from a transnational corporation (TNC), Merck, Sharpe and Dohme when 220 of his prized cows died of health problems caused by incinerator emissions. Scientists found dioxins and PCBs in the soil and vegetation of the farm.[31]

BRAZIL: The municipality of Sao Jose dos Campos, near Sao Paolo City, abandoned a proposal for an industrial waste incinerator after strong protest from the local community, trade unions and Greenpeace. MSW incineration has been banned by the city council of Diadema, Sao Paolo, citing the need for waste prevention.[32]

ARGENTINA: There has been a large increase in the no of incinerator proposals, mainly for hazardous waste. All incinerators in Argentina are facing strong, organised public opposition.[33]

FRANCE: In February 1995, a national coalition against incineration was founded. The coalition of over 50 environmental groups is working to overturn a 1992 law that envisions the building of 100 new incinerators.[34]

PORTUGAL: In 1993, a proposal to build a hazardous waste incinerator in Cines, Southern Portugal, was postponed. In 1994, the Portuguese government presented its waste plan, which included a hazardous waste incinerator and three possible locations – Cines, Setubal and one site in northern Portugal. The residents around all three sites worked together to oppose locating the incinerator anywhere in Portugal – not just in their 'own backyard'.[35]

MEXICO: In April 1992, following three years of local opposition, the federal environmental authorities cancelled an incineration proposal to burn Poly Chlorinated Biphenyl. The project was proposed by Chemical Waste Management (CWM) in the city of Tijuana on the US-Mexican border. Chemical Waste Management has repeatedly tried to persuade communities in Mexico and the estate of Veracruz to accept hazardous waste incinerators. All proposals have so far failed due to local opposition. In 1994, a proposal to build a hazardous waste incinerator in Santa Maria Del Rio, San Luis Potosi state, was abandoned after regional opposition. The project was proposed by a US company called Metalclad Corp. In March 1995, an environmental group in Chihuahua was protesting against a proposal to build a municipal waste-to-energy incinerator, promoted by a Canadian company, Alberta Special Waste Management.[36]

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33. Greenpeace Argentina
34. Greenpeace France
35. Greenpeace Spain
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Public Interest Litigation

There are instances when individuals and groups have taken recourse to the courts to ensure that an incinerator is not installed or to stop its operation. One way of going about it is filing a Public Interest Litigation (PIL). Here, the petitioner seeks to champion a public cause for the benefit of all society.

While filing a PIL the petitioner should ensure that the data provided is up-to-date and correct.

What is a PIL?

A PIL is a judicial process to provide relief to a person or a group of persons or representatives of people whose basic human rights have been or are being violated. PILs are also filed about the content or conduct of government policy.

The Supreme Court understands the PIL to be a participatory process between the judiciary, the government and the applicant.

Where can it be filed?

Under Article 32 of the Indian Constitution, a PIL can be filed in the Supreme Court of India for a violation of a fundamental right. Article 226 provides that such a PIL can also be filed at any High Court.

What are the requirements in a PIL?

Although the court can accept a simple letter to the Judges as a PIL, it is important that a proper affidavit be filed, with detailed facts and figures to strengthen the plea.

So while filing a PIL one must:

a. elaborate the problem.
b. explain how it violates a fundamental right (rights to health, environment, clean drinking water, clean air, etc)
c. specify the type of relief wanted.
d. cite expert studies and opinions to prove complex scientific and social issues.
e. discuss alternatives to the technology.

Since most PIL cases deal with aspects of technology, health and environment, which judges may not be familiar with, Special Commissioners or Expert Committees may be appointed by the judges to gather facts and data. It may be beneficial to provide all relevant materials to appointed commissioners or committees, since their report is treated as an unbiased appreciation of facts. Of course, both parties are free to dispute such a report.

Other points to be remembered

Since the nature of a PIL is public interest, a litigant cannot withdraw a PIL once filed.
Further, since the relief sought is more corrective than compensatory, it does not always flow from a narrow determination of rights alone. In fact, depending on the judge's sympathy for

the cause and the nature of the litigation itself, the outcome of a case can drastically change.

Another method of litigation is filing Intervention Petitions (IP) in an ongoing litigation. The Intervenor is a person or s/he represents a group of persons directly or indirectly affected by the outcome of the original litigation.

An IP can be filed at any stage of the original case, though not after it has been decided. The other parties in the original litigation can object to the IP, and the court will independently decide whether the intervenor should be heard in the case or not. Normally, if the IP is filed in public interest, the court will agree to hear the intervenors as well.

Apart from these, "Class Action Suits" can also be filed under Order 1, Rule 8 of the Code of Civil Procedure, 1908. For this, the class has to be numerous, all members of the class must have the "same interest" and the court must permit a few persons to sue and be sued on behalf of the class. This reduces the individual costs of litigation for the litigants. Though relatively untried, the class suit holds great promise for environmental litigation.

Orders which can be passed in PIL:

- The Court may issue directions of any nature to meet the problem brought before it.
- The Court may award compensation.
- The Court may award costs to the Petitioner even where the petition fails.
- The Court may transfer the petition to a High Court within whose jurisdiction the matter lies.
- The Court may issue appropriate interim direction as well, even though they may not have been prayed for.
- The Court may also be requested to appoint a commission to monitor the compliance with its orders.

Limitations of a PIL

- The Court might refuse to entertain a matter if it filed after much delay, otherwise reasons for the delay have to be stated.
- If appropriate (specially in those cases where Green Benches have been set up in the High court), the High Court should be approached first so that a channel of appeal to the Supreme Court is available.
- The Court will not interfere in a purely policy matter as that is within the realm of the government.
- The Court will not interfere where disputed questions of fact are involved.
- If a petition is dismissed on merits by speaking order then the same matter cannot be brought up again by fresh petition without showing any additional grounds and facts.

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Alternatives

In a waste management scheme the choice of disposal technology should figure last among the important considerations. The emphasis should be on:

- Waste segregation – the steps that separate waste into categories like biodegradable and non-biodegradable.
- Waste reduction – initiatives taken to reduce the amount of waste by choosing reusable alternatives, finding other uses for the used commodity or by finding commodities with less packaging.
- Waste recycling – the process that converts waste into a product which has economic value.
- Waste reuse – an initiative to find other uses for a commodity that has finished its useful life span, for example, making drawing paper out of calendars.
- Participatory approach – An initiative based on the involvement of the waste generators and, the formal and informal waste collection system.
- Worker protection. – technologies that reduce the worker's exposure to the hazards during the life cycle of a product–production, disposal.
- Materials use policy – a policy that decides the kinds of materials that should be used in different products and what should be done with them after their use.

In fact the choice of technology should synergise with these consideration.
The alternative technologies are participatory in nature and need the involvement of everyone in a community.

"The 30 per cent and 33 per cent recycling targets for 2010 and 2015 are 'depressingly unambitious'. Government must set higher recycling targets of 50 per cent by 2010 and 60 per cent by 2015 to show there is not a ceiling on recycling and composting potential."
–House of Commons Environment, Transport and Regional Affairs Committee, March 2001.

Municipal waste

Municipal waste consists of different types of materials. They can be clubbed into biodegradable and non-biodegradable waste. Biodegradable waste forms the largest part of the total waste generated. This can be converted into manure within the community. The non-biodegradable waste which needs more technical know-how to recycle/reuse it may prompt participation by the private sector.

What can be done with plastic waste?

The first option is to reduce the use of plastics. Another option is to involve the manufacturers of plastics and the manufacturers of plastic products to collect the plastic waste and to recycle it in an environmentally friendly manner. Also the existing plastic recycling facilities can be technically upgraded and proper working conditions for the workers can be ensured.

The collection can be done with the help of ragpickers. This would ensure that they are working in a less exploitative and cleaner work environments.

What can be done with paper waste?

It is important not to mix paper with the other waste. The reason for this is waste paper looses its value if it gets wet or is contaminated with other substances. A lot of paper waste is recycled back into paper. Paper is also reused. There are many households who make paper envelopes. By disposing paper separately the life of this material is extended.

Pit composting

Pit composting is a method that enhances natural biodegradation of biodegradable material.

In this method biodegradable waste such as kitchen waste or garden trimmings are collected in a pit daily. A slurry of fresh cow dung and water is added on a regular basis to the contents in the pit. The contents of the pit are stirred daily.

Cow dung has microbes, which increases the rate of decomposition of matter. These microbes also reduce the smell of the degrading waste. The heat generated during the process of biodegradation at the centre of the pit can reach 50° C.

These microbes/bacteria help convert the biodegradable waste into manure.

Vermicomposting

The method of vermicomposting uses earthworms to convert biodegradable waste into manure. Earthworms of the genus *Eisinia foetida* are inoculated into a layer of *khad* and coconut husk. These worms eat the waste and convert it into nitrogen rich manure.

Hospital waste

The Biomedical Waste (Management and Handling) Rules provide three other technologies besides incineration for the management of waste. They are:

- Microwave
- Autoclave
- Chemical disinfection

Except for pathological waste and date expired drugs all the other types of waste can be treated by these technologies.

These technologies can only work if waste is first segregated. To ensure that waste is segregated hospital staffs have to be trained to:

- Identify different types of waste
- Understand their hazardous nature
- Choose proper bin/waste receptacle so that waste is properly treated

Chemical disinfection

Chemical disinfection is cost-effective and does not require large investments.

Bleaching powder is one of the best chemical agents that can be used for disinfection.

A one per cent bleach solution (10 gm of bleach in one litre of water) is suitable to disinfect all disposable medical items. All the waste has to be immersed in the solution for an hour.

This solution can be prepared in waste bins that have a perforated inner chamber that is easily removable. The infected items can be put into the bin. The perforations will insure that the waste comes in contact with the bleach and at the same time reducing the level of contact during the removal of the waste. All rubber and plastic waste can be put here. It is very important that the plastic and rubber waste be mutilated prior to disinfection.

Such bins should be kept at all points of waste generation in a hospital.

Microwave

this is similar to the household microwave. Waste is put into a microwave it is then sprinkled with water. High frequency waves agitate the water molecules and convert it into steam. The steam disinfects the waste. The high temperature distorts the waste inside the microwave making it unfit for reuse.

Autoclave

It is similar to a pressure cooker. Waste is treated with high temperature steam under pressure for a period of time. Steam comes in direct contact with the waste and disinfects it.

There is a new technology that is being tried out currently:

Hydroclave

It uses indirect heat to disinfect the waste. This technology has a container with a steam jacket that heats the waste. The waste is evenly heated because the container is rotated. There is also a shredder inside the container which cuts the waste into small pieces.

Government policy on waste: Documents and Rules

Municipal Waste Policy in India

The following policy level documents have been produced in recent years:

Report of the Expert (J L Bajaj) Committee of the Planning Commission, May 1995

The committee was set up post the reported plague outbreak in Surat, in 1994, headed by Prof J L Bajaj, Member, Planning Commission, and 11 other experts. The report which was submitted in May 1995, recommended for the application of appropriate low cost eco-friendly technologies, and large-scale public-private partnerships in garbage management.

Committee on Solid Waste Management in Class I Cities in India. Constituted by the Supreme Court of India, June 1998, under the PIL No W.P. (C) 888 of 1996, in the Supreme Court of India in the matter of Almitra H Patel and Another vs Union of India and Others

Asim Burman, Commissioner, Calcutta Municipal Corporation as Chairperson and eight members headed this committee set up in response to the above case. The report emphasis the role of partnerships in primary collection and also recommends composting as the main manner to dispose of municipal waste keeping in mind the nature of Indian garbage.

Ministry of Urban Affairs and Employment, Shukla Committee's manual on Municipal Solid Waste Management (January 2000)

This Committee headed by Dr S R Shukla, in the Ministry of Urban Affairs and employment and with a 13-member committee development this manual for application in various cities in India.

Report of the National Plastic Waste Management Task Force (August 1997)

Though this deals with plastics waste, its outcome impacts about 5 per cent of urban solid waste, which constitutes plastic. The Task force headed by the Chairman Central Pollution Control Board, Dr D K Biswas, and members and representatives of the plastics industry in India, has opted for soft options of controlling plastic waste littering and informal sector recycling, rather than examining linkages with concepts of extended producer responsibility and economic instruments.

Municipal Solid Waste (Management and Handling) Rule, 2000

At the national policy level, the Ministry of Environment and Forests has recently legislated the Municipal Waste Management and Handling Rules, September 2000. The law details the practices meant to be followed by the various municipalities for managing urban waste. It bans burning of chlorinated plastics and products in incinerators. However the law does not address mechanisms, which will be needed, for promoting recycling or provides for any public participation, despite the fact that the rules have been an outcome of public pressure and the immense work done by NGOs and community groups.

Waste as an energy policy

The Ministry of Non-Conventional Energy Sources (MNES) set up with the objectives of supplementing energy demand through the use of wind, solar, biomass and waste as energy sources.

To promote waste as energy source, its provides incentives like:

- Financial assistance up to 50 per cent of the capital costs of the project, limited up to Rs 3 crore per MW for demonstration project.
- Urban Local Bodies receive financial incentives at Rs 15 Lakh per MW for providing garbage free of cost to the project site and land on long-term basis on nominal rent.
- Financial institutions also get financial incentives to promote non-conventional energy resources
- State electricity boards receive financial incentives on cost of equipment and differential power tariff the energy generated is fed to the grid.

Apart from the MNES, the Indian Renewable Energy Development Agency, a government of India enterprise, give about 70 per cent - 80 per cent financial assistance to waste-to-energy projects.

Medical Waste Policy in India

Biomedical Waste (Management and Handling) Rule, 1998

The rule lays down responsibilities of the health case facilities in managing their waste. It makes waste segregation and collection in separate bins mandatory. It also lays down practices for handling, storage, transportation and disposal. The rule bans the burning of chlorinated plastics and products disinfected with chlorine in incinerators.

Terms used in incineration

- Acute exposure - short exposure to a toxic; technically, exposure for 14 days or less
- Acute toxicity - the toxic or poisoning effect that occurs shortly after an acute exposure
- Activated carbon filters - type of filter used to decrease pollution in incineration. Placed at the smokestack. Contains charged carbon that attracts particles towards it
- ADI - Average daily intake or ADI is the maximum dose of a substance that can be consumed daily without posing a significant lifetime risk
- Batch-fed incinerator - an incinerator model, where no new waste is added to an incinerator until all the current load is completely burnt
- Bioaccumulation - the process of accumulation of pollutants in the body due to every day exposure via ingestion and inhalation
- Biomagnification - the process of increasing concentration of pollutants along the food chain. Starting with low levels of pollutants in organisms at the bottom of the food chain, to very high concentrations of pollutants in animals on top of the food chain
- Biomedical waste - waste generated from health care facilities
- Bottom ash - ash that collects in the receptacle of the incinerator from the burning of waste
- Infectious waste - part of bio-medical waste that can spread infection
- Restricted Medical Waste (RMW) - infectious waste or hazardous medical waste
- Calorific value - the amount of heat that can be generated by the burning of a substance
- Carcinogen/carcinogenic - the ability of a substance to cause cancer
- Chronic exposure - exposure at low concentrations but for a long period of time
- Chronic toxicity - the toxic or poisoning effect of a series of small doses given over a long period of time
- Combustion effects - deviations from ideal performance of the incinerator
- Concentration - the ratio of the amount of a substance to the amount of medium it is mixed in. Measured in mg/L or ppm or g/m3
- Continuous feed incinerator - type of incinerator where waste is continuously fed
- DE - destruction efficiency is the difference between the chemicals fed into an incinerator and their presence in the smoke and ash and fluids after incineration. It gives the efficiency of an incinerator to destroy hazardous chemicals. DE provides a better standard for incineration because it looks at pollutants in ash, smoke and other sources
- DRE - destruction reduction efficiency is the difference between a chemical fed into the incineration and its quantity, after combustion, in the smoke. This does not give a true representation of an incinerator capability because DRE is based on one chemical and one outlet (i.e. smoke)
- Dioxin and furans - polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dobenezofurans (PCDFs) are commonly referred to as dioxins and furans or collectively as dioxins. There 210 individuals congeners (chemicals) in the group. Some of the chemicals are more toxic than the others and cause cancer, endocrine disruption and suppress the immune system

- Disinfection - the process which inactivates pathogens. The World Health Organisation recommends the disinfection of medical waste
- EFW or WTE – energy-from-waste or waste-to-energy involves generating heat from the burning of waste. This heat is then used to generate electricity or used to maintain the temperatures in one of the chambers in the incinerators
- Electrostatic precipitator - a kind of pollution control device installed in the smoke stack of an incinerator. It consists of two charged electrodes. This charges the particles in the smoke, they collect together and fall into the receptacle for bottom ash
- Endocrine disrupter - a chemical that disrupts the normal functioning of the endocrine system (hormonal system) by mimicking hormonal signals
- Flue gas - gases that escape from the machinery of the incinerator
- Fluid bed incinerator – an incinerator that uses sand as a base. The sand on heating becomes fluidised. Provides even heating of the contents in the chamber
- Fly ash - the ash produced from the burning of waste that rises out of the fire box in an incinerator
- Hysteresis effect - retention within the combustion system of Principal Organic Hazardous Constituents coupled with their continuous appearance in stack gases for a long period of time after their flow in the combustion system has stopped.
- Landfills - humanmade or modified depression in ground that has been lined with liner systems to prevent contact of waste with ground. There are different types of landfills for different types of waste
- Leachate - liquids released by the waste (in a landfill/dump) due to their decomposition or water contaminated with chemicals released by the waste.
- Leaching - the process of spread of liquid contaminants from the dump into surrounding soil and water bodies.
- LOAELS - Lowest Observable Adverse Effect levels. The lowest dose of a toxic that causes some effect. Also known as LOELS (Lowest Observable Effect levels)
- Mass burn incinerator - as the name suggests its an incinerator where all types of waste are burnt
- Municipal Solid Waste (MSW) - waste generated within human habitation through the process of human endeavour and living
- NOx - oxides of nitrogen
- PAH - Poly Aromatic Hydrocarbons (PAH). Highly reactive compounds consisting of hydrogen and carbon atoms arranged in multiple rings
- PIC - Products of Incomplete Combustion (PIC), term used to identify chemicals formed in the process of burning waste. Includes dioxin, furans and heavy metals
- POHC - Principal Organic Hazardous Constituents
- Pyrolator - technology that burns waste in a low oxygen conditions
- Pyrolysis - process in which waste is burnt in the absence of oxygen. There is no direct heat
- RDF - Refused Derived Fuel is technology for energy generation from waste. It can also mean the use of dehydrated waste as a fuel. In most cases this type of fuel has its energy base in the plastics found in the waste
- Residence time - the duration of waste lying in a chamber
- Scrubbers - pollution control equipment in which the smoke is passed through water so that the water absorbs some pollutants, this is known as wet scrubbers. In dry scrubbing the smoke is passed through lime.

- SOx - oxides of sulphur
- SPM - suspended particulate matter
- Sterilisation - destruction of pathogens
- TDI - total daily intake
- TEQ - Toxic Equivalency Quotient (TEQ)
- Test burns - incineration carried out under ideal situations, where levels of some of the pollutants are calculated
- Three T's of incineration
  - Time - the period the waste spends in different chambers of the incineration
  - Temperature - the temperature within each chamber in which the waste burns
  - Turbulence - the flow of air in the chambers to ensure equitable heat dispersion within the waste
- Toxic - substances that debilitates the normal functioning of the human body
- VOC - Volatile Organic Compounds (VOC)

Units of measurement

1. mg – milligrams (one thousandth of a gram, 10^{-3})
2. mg – microgram (one millionth of a gram, 10^{-6})
3. ng – nanogram (one billionth of a gram, 10^{-9})
4. pg – pico grams (one million millionth of a gram, 10^{-12})
5. fg – femtogram (one thousand million millionth of gram, 10^{-15})
6. kg – kilogram (one thousand grams)
7. ppb – parts per billion
8. ppm – parts per million
9. kilo – a thousand (10^3)
10. mega – a million (10^6)
11. gr – grain 1/7000 pounds
12. dscf – dry standard cubic foot – 0.02832 cubic meters
13. dNm^3 – dry normal cubic meter – (assumes temp. is O°C)
14. dscm – dry standard cubic meter (temperature is 25°C)

Conversions

Concentration in ppm – concentration in mg/nm^3x (24.5/molecular weight of the substance)

Dry standard cubic meter (dscm)

Dry standard cubic meter (dscm) is a way to standardise measurements of the concentrations of pollutants in exhaust gas.

The volume of gas varies depending on the temperature of the gas, the amount of water vapour in the gas, the amount of oxygen in the gas, etc. Without a standardised unit, it would be impossible to directly compare emissions from two sources operating under different conditions. That is why we use "dry standard cubic meters corrected to 7 per cent oxygen" or dscm. So, first, you measure the concentration of a pollutant in exhaust gas from a source. Then, you also measure the moisture content of the exhaust gas, the oxygen content of the exhaust gas, the temperature of the exhaust gas, etc. Then, you use conversion factors to calculate the concentration of the pollutant in the exhaust gas if the exhaust gas were dry, contained 7 per cent oxygen, and had a standard temperature. This way, you can compare measurements of pollutant concentrations from different sources and obtain a comparison.

To standardise for Oxygen (O_2) –

Concentration (in any unit) at 7 per cent O_2 – Concentration in same unit x 15/(21 – measured per cent of O_2)

To standardise for carbon dioxide (CO_2)

Concentration (in any unit) at 12 per cent CO_2 – Concentration in same unit x 12/measured CO_2

Heating value of typical solid waste components

S. No	Material	Energy content per pound in (British Thermal Units/BTU) (1 BTU = 1,055 Joules. 4.2 Joules = I calorie)
1.	Paper	7,700
2.	Food waste	1,800
3.	Yard waste	4,200
4.	Plastic	17,000
5.	Glass	-
6.	Metal	-
7.	Miscellaneous	1,000

Source P O Leary, P Walsh and F Cross, Univ Of Wisconsin-Madison, Solid and Hazardous Waste Education Centre. Reprinted from *Waste Age* Correspondence Course articles 1987

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Websites related to incineration

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2. Health Care Without Harm - www.noharm.org
3. Citizens Clearinghouse for Hazardous Waste - www.essential.org
4. Global Anti Incineration Alliance/ Global Alliance for Incinerator Alternatives (GAIA) - www.no-burn.org
5. Greenpeace International - www.greenpeace.org
6. Friends of the Earth - www.foe.co.uk

LIST OF NGOS WORKING ON WASTE MANAGEMENT AND INCINERATION ISSUES

Organisation	Contact	Address	Phone	Email
RISE	P K Venkatramanan	55,1st cross, HAL III stage, Banglore-560075	5280104 5285349	Pkvenki@hotmail.com
CEE, South	Vittal Kumar A	Kamala Mansion, 143 Infantry Road, Banglore-560001	2862167 2869094	ceesouth@vsnl.com
WASTE WISE	Anslem Rosario	1300D,1st cross, 1st main, HAL III stage, New Thippasandra, Banglore-560075	5273941	msss@vsnl.com
KARUNA	Ms R Chandra	No2, Karuna, Mother Teresa Home, 2nd Cross, Silver Jubilee Park Road, Bangalore 560002	2217463	
EXNORA	T K Ramkumar	42, Pelathrope, Mylapore, Chennai-600004	4940022	exnora@vsnl.com
THE SAVE BOMBAY COMMITTEE	Kisan Mehta	620 Jame Jamshed Road, Dadar East, MUMBAI 400 014	4149688	kisansbc@vsnl.com
DIGNITY FOUNDATION	Neeta Khajuria	BMC School building, Opp lamington Road police station, Topiwala lane, Mumbai-400007	3898079	
BOMBAY FIRST		Vazirani Villa, Scheme42, Worli Sea Face, Mumbai 400018	4975394 4975395	
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CONTACT FORMS

Campaigners should attempt to spread information about their campaign and the incinerator involved to as many individuals and NGOs as possible. The reason is different groups look at an incineration campaign from different angles. For example some groups may see incinerators as a case of funding agencies promoting bad technology, others would see these as case of waste of resources while others would fight incinerators from the workers' health angle.

FORM

Name of contact person _____

Address _____

Phone _____

Fax _____ Email _____

Campaign details

Campaigning against

Already installed incinerator [ ] Plans to install an incinerator [ ] Preventive [ ]

What sort of campaign has been undertaken? _____

People met _____

Material collected (enclose copies of any analysis carried out) _____

What has been the response from the press? _____

What has been the response from the officials? _____

What kind of help do you require? _____

Incinerator details

Capacity of incinerator _____

Where is it being/has been set up? _____

Who owns the incinerator? _____

Who are the manufacturers of the incinerator? _____

What kind of waste is fed in the incinerator? _____

What is done with the ash? _____

Any other details? _____

_____

_____

NOTES

NOTES

FEEDBACK FORM FOR THE MANUAL

(Please fill up this form and send it back to us)

Name _____

Address _____

Phone _____

Fax _____ Email _____

From where did you get a copy this guide?

_____

_____

_____

Are you campaigning against an incinerator?

_____

_____

_____

If yes, was this guide of any help? (Please elaborate)

_____

_____

_____

What other information would you like us to include in this guide?

_____

_____

_____

If you are not campaigning, did the guide explain the anti-incinerator stand?

_____

_____

_____

Please fill in this form and send it to:

Srishti/Toxics Link

H-2, Jungpura Extension

New Delhi 110 014